



Specifying an airtight building envelope that may qualify for IRA funding

On August 16, 2022, President Biden signed the Inflation Reduction Act (IRA) into law, making the new bill the largest in U.S. history focused on combating climate change. More than \$300 billion will be invested in energy and climate reform through energy tax incentives, investments in clean energy production, and tax credits aimed at reducing carbon emissions.

The IRA provides unique opportunities for the commercial construction community. Architects, engineers, and designers can benefit from the updates to Section 179D of the IRS tax code. The code allows tax-exempt building owners to pass this deduction, related to energy-efficient commercial buildings, to architects and engineers, two groups who greatly influence building design. Previously, only government building owners could allocate funds to designers.

ASHRAE Standards and maximizing tax credits

IRA credits will be calculated based on building energy savings realized compared to the ASHRAE 90.1 benchmark. American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Standard 90.1 provides energy efficiency requirements for commercial buildings. It has been the benchmark for commercial building energy codes in the United States and a key basis for codes and standards around the world for more than 35 years.

Section 179D outlines how commercial building owners can qualify for deductions:

- Commercial building owners must demonstrate that the building exceeds ASHRAE 90.1 by a minimum of 25% to receive a deduction of \$2.50 per square foot
- Deduction increases by 10-cent increments for each percentage point improvement, up to 50%, or \$5.00 per square foot
- For existing buildings, owners must demonstrate 25-50% energy use reduction over the existing baseline to be eligible for the deduction: \$2.50-\$5.00 based on the percentage of energy reduction

Common Commercial Air Barrier Tests

A wide range of test standards exist for evaluating building materials and systems. ASTM E779 is the most important test for IRA energy credit deductions as it has the strongest correlation to whole building energy efficiency. ASTM E2357 and ASTM E2178 are also referenced in ASHRAE 90.1 as they are common pre-requisites to achieving good performance to ASTM E779.

ASTM E779

ASTM E779 Whole Building Air Tightness Testing is a process in which the building envelope is tested to quantify the air tightness. The test measures air leakage rates through a building envelope under sustained static pressure difference. Both the Air Barrier Association of America (ABAA) and the ASHRAE 90.1 Standard require the whole building air leakage rate not to exceed 0.4 CFM/ft² at 1.57 PSF (2.0 L/s•m² at 75 Pa) when tested to ASTM E779. Whole building air leakage testing is a compliance path, but not the only path. Alternatively, all materials and assemblies in the building envelope can be qualified to ASTM E2178 and ASTM E2357, respectively. The continuity of the materials and assemblies is then planned in details and mockups then verified by inspections and field testing.

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ASTM E2357

ASTM E2357 subjects specified air barrier assemblies to static and dynamic wind loads, both infiltration and exfiltration. The air leakage is reported at 1.57 PSF (75 Pa) after exposure to the wind cycles. The air barrier assemblies specified in the test method incorporate the air barrier material and accessories installed over opaque substrates

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as well as joints, a window opening, penetrations, terminations, and connections. The intent of this test is to measure performance of an assembly as it would be installed per manufacturer's instructions. This test demonstrates how a fully sealed air barrier assembly responds to intense, sustained wind load conditions that are likely to cause leaks in real-world situations.

Both ABAA and the ASHRAE 90.1 Standard require that an air barrier assembly provide an air leakage rate not to exceed 0.04 CFM/ft² at 1.57 PSF (0.2 L/s x m² @ 75 Pa) when tested. Although this is a laboratory procedure, the method is used to qualify published details which are then used to guide field installation.

ASTM E2178

ASTM E2178 is the Standard Test Method for Determining Air Leakage Rate and Calculation of Air Permeance of Building Materials. This test method measures the air leakage rate of building materials that will be used as the air barrier at various pressure differentials. The accepted level of air permeance of materials defined in many local codes and standards is less than 0.004 cfm/ft² @ 1.57 lb/ft² (0.02 L/(s • m²) @ 75 Pa). This value is also used by the Air Barrier Association of America (ABAA) in its evaluation of air barrier materials.

Continuity is key

Continuous air barriers are required per the 2012 and later editions of the International Energy Conservation Code (IECC) and in 2010 and later versions of ASHRAE 90.1. When continuity is broken between materials, components, assemblies, and systems the building leaks. Continuity between systems installed by different trades can be difficult to achieve. Examples include the junction of a curtain wall to the wall or the junction of the roof to the wall. Achievement of air barrier continuity requires cooperation of the whole construction project team as well as good material quality and verified compatibility.

Henry® Company has a proven track record of providing quality materials, thorough testing for performance and compatibility, clear installation instructions and prompt

field support. We have facilitated the construction of airtight building envelopes throughout the country for many years.

Our Tests

Henry tests all air barrier materials to ASTM E2178 for air leakage. As mentioned earlier, AHRAE 90.1 requires air barrier materials to achieve 0.004 CFM/ft² @ 1.57 PSF or less. Henry products measure much lower than that.

In addition, Henry tests each air barrier membrane product with its accessory products as an air barrier assembly to ASTM E2357. AHRAE 90.1 requires that each type of air barrier assembly achieve 0.04 CFM/ft² @ 1.57 PSF or less. Our tested assemblies measure much lower than that.

Henry offers a complete portfolio of fluid applied and self-adhered air barriers that can help support these ASHRAE 90.1 requirements. Henry lists passing measurements on product data sheets available on our website and on our ASTM E2357 Tech Talk.

Our Quality and Support

Henry invests significant resources in the quality control of its products as well as providing resources to facilitate their correct selection and installation. Installation requirements provided by our literature and published details mirror materials and instructions used in ASTM E2357 test mockups. In addition, Henry provides training and field support for installers and design professionals to assist with the seamless integration of the building envelope's air and water barriers, essential for energy efficient and durable building.

HENRY can help maximize IRA tax credits

Henry is a recognized leader and expert in the air barrier industry. Our fully adhered air barrier systems easily fulfill the toughest code requirements and specifications. Our experts are ready to consult with you on a plan to help your building perform 50 percent better than the ASHRAE 90.1 and achieve maximum IRA tax credits. [Schedule a meeting with a Henry representative today.](#)

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productsupport@henry.com | 1-800-486-1278
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